

Claims

1. An isolated nucleic acid molecule encoding aldehyde dehydrogenase which comprises a polynucleotide being at least 95% identical to the nucleotide sequence of SEQ ID NO: 1.
- 5 2. An isolated nucleic acid molecule encoding aldehyde dehydrogenase which comprises a polynucleotide being at least 95% identical to the polynucleotide selected from the group consisting of (a) nucleotides 258-2084 of SEQ ID NO: 1, (b) nucleotides 351-2084 of SEQ ID NO: 1, (c) nucleotides 258-1955 of SEQ ID NO: 1, and (d) nucleotides 351-1955 of SEQ ID NO: 1.
- 10 3. An isolated nucleic acid molecule encoding aldehyde dehydrogenase which comprises a polynucleotide selected from the group consisting of (a) a polynucleotide encoding the polypeptide having the amino acid sequence of SEQ ID NO: 2, (b) a polynucleotide encoding the polypeptide consisting of amino acids 32-609 of SEQ ID NO: 2, (c) a polynucleotide encoding the polypeptide consisting of amino acids 1-566 of
15 SEQ ID NO: 2, and (d) a polynucleotide encoding the polypeptide consisting of amino acids 32-566 of SEQ ID NO: 2.
4. An isolated nucleic acid molecule encoding a polypeptide having aldehyde dehydrogenase activity, wherein said nucleic acid molecule hybridizes under standard conditions to the complementary strand of a nucleic acid molecule of any one of claims 1
20 to 3.
5. An expression vector which comprises the nucleic acid molecule of any one of claims 1 to 4.
6. The expression vector of claim 5, wherein said vector is selected from a vector or a derivative thereof selected from the group consisting of pQE, pUC, pBluescript II,
25 pACYC177, pACYC184, pVK100 and RSF1010.
7. A recombinant microorganism which is transformed with the expression vector of claim 5.
8. A recombinant microorganism which comprises the nucleic acid molecule of any one of claims 1 to 4 integrated into its chromosomal DNA.
- 30 9. The recombinant microorganism of claim 7 or 8, wherein said microorganism is selected from the group consisting of bacteria, yeast, and plant cells.

10. The recombinant microorganism of claim 9, wherein said microorganism is selected from the group consisting of *Gluconobacter*, *Acetobacter*, *Pseudomonas*, *Klebsiella*, *Acinetobacter*, and *Escherichia*.
11. The recombinant microorganism of claim 10, wherein said microorganism is
5 *Gluconobacter oxydans* DSM 4025.
12. A process for the production of 2-keto-L-gulonic acid (2-KGA) and/or vitamin C from L-sorbose comprising (a) cultivating the recombinant microorganism of claim 7 or 8 in an appropriate culture medium, and (b) recovering and separating 2-KGA and/or vitamin C from said culture medium.
- 10 13. A process for the production of 2-KGA from L-sorbose comprising (a) cultivating a microorganism belonging to *Gluconobacter oxydans* DSM 4025 in an appropriate culture medium, wherein the gene encoding aldehyde dehydrogenase represented by SEQ ID NO: 2 is disrupted in said microorganism, and (b) recovering and separating 2-KGA from said culture medium.
- 15 14. A process for the production of aldehyde dehydrogenase comprising (a) cultivating a recombinant microorganism comprising a nucleic acid molecule of any one of claims 1 to 4 in an appropriate culture medium, and (b) recovering and separating said aldehyde dehydrogenase from said culture medium.
